UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/725,599	12/03/2003	Jae-Bon Koo	6161.0104.US	4875

58027 7590 06/27/2006

H.C. PARK & ASSOCIATES, PLC
8500 LEESBURG PIKE
SUITE 7500
VIENNA, VA 22182

EXAMINER	
WILLIAMS, JOSEPH L	
ART UNIT	**PAPER NUMBER**
2879	

DATE MAILED: 06/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/725,599	Applicant(s) KOO ET AL.	
	Examiner Joseph L. Williams	Art Unit 2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 03 December 2003.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-34 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-34 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 12/3/03.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-34 are rejected under 35 U.S.C. 102(e) as being anticipated by Koo et al. (US 6,876,001 B2)

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Regarding claim 1, Koo ('001) teaches in figure 1 and in column 5, line 20 through column 7, line 11, a flat panel display comprising; a plurality of pixels, each pixel including a plurality of sub-pixels (R, G, B), each sub-pixel comprising a self-

luminescent element (not shown); and driving thin film transistors (20) each driving transistor having a semiconductor active layer having a channel region (not shown) connected to the self-luminescent elements of the sub-pixel to which the driving transistor belongs to supply current to each of the self-luminescent elements, wherein at least the channel regions of the semiconductor active layers have different crystal grains for different sub-pixels.

Regarding claim 2, Koo ('001) teaches there are sub-pixels for at least two different colors (R, G, B).

Regarding claim 3, Koo ('001) teaches the channel regions of the semiconductor active layers have different crystal grains for the sub-pixels associated with each of a plurality of different colors.

Regarding claim 4, Koo ('001) teaches the difference in the crystal grains between the channel regions is determined by an amount of current flowing in each of the sub- pixels, associated with each of a plurality of different colors.

Regarding claim 5, Koo ('001) teaches the difference in the crystal grains between the channel regions is determined by a current mobility value of each of the channel regions.

Regarding claim 6, Koo ('001) teaches the difference in the crystal grains between the channel regions is determined by a size of the crystal grains of each of the channel regions.

Regarding claim 7, Koo ('001) teaches the size of each of the crystal grains of each of the channel regions is proportional to an amount of current flowing in each of

the sub- pixels of different colors when a substantially identical driving voltage is applied to the sub- pixels associated with each of a plurality of different colors.

Regarding claim 8, Koo ('001) teaches the size of each of the crystal grains of each of the channel regions is proportional to a current mobility value of each of the channel regions.

Regarding claim 9, Koo ('001) teaches the difference in the crystal grains between the channel regions is determined by a shape of the crystal grains of each of the channel regions.

Regarding claim 10, Koo ('001) teaches the shape of each of the crystal grains of each of the channel regions is determined so that at least the channel regions of sub-pixels in which a lowest amount of current flows at an identical driving voltage have shapeless grain boundaries.

Regarding claim 11, Koo ('001) teaches the shape of each of the crystal grains of each of the channel regions is determined so that at an identical driving voltage at least the channel regions of the sub-pixels in which a higher current flows than the amount of current flowing in sub-pixels with the shapeless grain boundaries have parallel primary grain boundaries in at least one strip and a rectangular shape and side grain boundaries of anisotropic grains extending approximately perpendicular to the primary grain boundaries and between adjacent primary grain boundaries.

Regarding claim 12, Koo ('001) teaches the shape of each of the crystal grains of each of the channel regions is determined so that at least the channel regions of sub-pixels in which a highest amount of current flows at a substantially identical driving

voltage have parallel primary grain boundaries in strips and side grain boundaries of anisotropic grains extending approximately perpendicular to the primary grain boundaries and between adjacent primary grain boundaries.

Regarding claim 13, Koo ('001) teaches the shape of each of the crystal grains of each of the channel regions is determined so that at least the channel regions of sub-pixels having a lowest current mobility have shapeless grain boundaries.

Regarding claim 14, Koo ('001) teaches the shape of each of the crystal grains of each of the channel regions is determined so that at least the channel regions of sub-pixels with a current mobility higher than the sub-pixels having the shapeless grain boundaries have parallel primary grain boundaries in the shape of at least one strip and a rectangle and side grain boundaries of anisotropic grains extending approximately perpendicular to the primary grain boundaries and between adjacent primary grain boundaries.

Regarding claim 15, Koo ('001) teaches the shape of each of the crystal grains of each of the channel regions is determined so that at least the channel regions of sub-pixels with a highest current mobility have parallel primary grain boundaries in strips and side grain boundaries of anisotropic grains extending approximately perpendicular to the primary grain boundaries and between adjacent primary grain boundaries.

Regarding claim 16, Koo ('001) teaches at least the channel regions of the active layers are formed of polycrystalline silicon (see column 4, lines 35-38).

Regarding claim 17, Koo ('001) teaches the polycrystalline silicon is formed using a solidification method using a laser (see column 4, lines 35-38).

Regarding claim 18, Koo ('001) teaches a flat panel display comprising: a plurality of pixels, each pixel including sub-pixels of red, green, and blue colors, each sub-pixel comprising a self-luminescent element, and driving thin film transistors, each driving the film transistor having a semiconductor active layer with a channel region connected to the self-luminescent element of the sub-pixel to which the driving transistor belongs in order to supply current to each of the self-luminescent elements, wherein the channel regions of the semiconductor active layers have different crystal grains for the sub-pixels at least two different colors.

Regarding claim 19, Koo ('001) teaches the difference in the crystal grains between the channel regions is determined according to a size of each of the crystal grains of each of the channel regions.

Regarding claim 20, Koo ('001) teaches the size of each of the crystal grains of each of the channel regions is determined so that a current of a smallest value flows in the green sub-pixels.

Regarding claim 21, Koo ('001) teaches the size of each of the crystal grains of each of the channel regions is determined so that the value of current flowing in the sub-pixels decreases in the sequence of red, blue, and then green sub-pixels when an identical driving voltage is applied to the red sub-pixels, blue sub-pixels, and the green sub-pixels.

Regarding claim 22, Koo ('001) teaches the size of each of the crystal grains of each of the channel regions is determined so that the channel regions of the semiconductor active layers of the green sub-pixels have a smallest mobility value.

Regarding claim 23, Koo ('001) teaches the size of each of the crystal grains of each of the channel regions is determined so that the mobility values of the channel regions of the sub-pixels decrease in the sequence of red, blue, and then green sub-pixels.

Regarding claim 24, Koo ('001) teaches the size of each of the crystal grains of each of the channel regions decreases in the sequence of red, blue, and then green sub-pixels.

Regarding claim 25, Koo ('001) teaches the difference in the crystal grains between the channel regions is determined by a shape of the crystal grains of each of the channel regions.

Regarding claim 26, Koo ('001) teaches the shape of each of the crystal grains of each of the channel regions is determined so that a current of a smallest amount flows in the green sub-pixels.

Regarding claim 27, Koo ('001) teaches the shape of each of the crystal grains of each of the channel regions is determined so that the amount of current flowing in the sub- pixels decreases in the sequence of red sub-pixels, blue sub-pixels, and then the green sub-pixels when an identical driving voltage is applied to the red sub-pixels, the blue sub-pixels, and the green sub-pixels.

Regarding claim 28, Koo ('001) teaches the shape of each of the crystal grains of each of the channel regions is determined so that the channel regions of the semiconductor active layers of the green sub-pixels have a smallest mobility value.

Regarding claim 29, Koo ('001) teaches the shape of each of the crystal grains of each of the channel regions is determined so that the mobility values of the channel regions of the sub-pixels decrease in the sequence of the red sub-pixels, the blue sub-pixels, and then the green sub-pixels.

Regarding claim 30, Koo ('001) teaches the crystal grains of at least the channel regions of the red sub-pixels among all of the channel regions of the sub-pixels have parallel primary grain boundaries and side grain boundaries of anisotropic grains extending approximately perpendicular to the primary grain boundaries and between adjacent primary grain boundaries, and the primary grain boundaries are in the shape of strips perpendicular to the 15 lengthwise of the active layers of the red sub-pixels.

Regarding claim 31, Koo ('001) teaches at least the channel regions of the green sub-pixels among the channel regions of all of the sub-pixels have shapeless grain boundaries.

Regarding claim 32, Koo ('001) teaches at least the channel regions of the blue sub-pixels among the channel regions of all of the sub-pixels have parallel primary grain boundaries in a rectangular shape and side grain boundaries of anisotropic grains extending approximately perpendicular to the primary grain boundaries and between adjacent primary grain boundaries.

Regarding claim 33, Koo ('001) teaches at least the channel regions of the semiconductor active layers are formed of polycrystalline silicon.

Regarding claim 34, Koo ('001) teaches the polycrystalline silicon is formed using a solidification method using a laser (see text for figure 2).

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph L. Williams whose telephone number is (571) 272-2465. The examiner can normally be reached on M-F (6:30 AM-3:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Joseph Williams

Joseph L. Williams
Primary Examiner
Art Unit 2879